

### REMARKS

In response to the Office Action mailed June 14, 2004, Applicants respectfully request reconsideration. To further the prosecution of this Application, Applicants submit the following remarks and have added new claims.

Claims 1-22 were pending in this Application. By this Amendment, claims 23-26 have been added. Accordingly, claims 1-26 are now pending in this Application. Claims 1, 7, 13, 19, 22, 23, and 24 are independent claims and the remaining claims are dependent claims.

Claims 1-3, 5-9, 11-15, 17-20, and 22 have been rejected. Claims 4, 10, 16, and 21 have been objected to as being dependent upon a rejected base claim but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

In this Amendment, claims 1, 4, 7, 10, 13, 16, 19, 21, and 22 have been amended and claims 23-26 have been added. The Applicant believes that the claims as presented are in condition for allowance. A notice to this affect is respectfully requested.

Claims 1, 2, 5, 7, 8, 11, 13, 14, 17, 19, and 22 are rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 6,191,478 (hereinafter Chen). Claims 3, 6, 9, 12, 15, 18, and 20 are rejected under 35 U.S.C. §103(a) as being unpatentable over Chen. The Applicant respectfully disagrees with these contentions and asserts that the present claimed invention is not anticipated by any disclosure in the Chen reference.

### Preliminary Matters

Applicant wishes to thank Examiner Chervinsky for the clarity and detail provided in the Office Action. This enabled Applicant to better prepare a response in connection with the claims.

### Claim Amendments

Claim 1 has been amended to include subject matter found in objected to claim 4. Claim 1 is in a condition for allowance and should be allowed to issue. Furthermore, claims 2-6 that depend upon independent claim 1 should also be allowed to issue, at least,

for depending upon an allowable independent claim. Reconsideration of the rejection is respectfully requested.

Claim 7 has been amended to include subject matter found in objected to claim 10. Claim 7 is in a condition for allowance and should be allowed to issue. Furthermore, claims 8-12 that depend upon independent claim 7 should also be allowed to issue, at least, for depending upon an allowable independent claim. Reconsideration of the rejection is respectfully requested.

Claim 13 has been amended to include subject matter found in objected to claim 16. Claim 13 is in a condition for allowance and should be allowed to issue. Furthermore, claims 14-18 that depend upon independent claim 13 should also be allowed to issue, at least, for depending upon an allowable independent claim. Reconsideration of the rejection is respectfully requested.

Claim 19 has been amended to include subject matter found in objected to claim 21. Claim 19 is in a condition for allowance and should be allowed to issue. Furthermore, claims 20-21 that depend upon independent claim 19 should also be allowed to issue, at least, for depending upon an allowable independent claim. Reconsideration of the rejection is respectfully requested.

Claim 22 has been amended to include subject matter found in previously examined and objected to claim 4. Claim 22 is in a condition for allowance and should be allowed to issue.

#### Newly Added Claims

Claims 23-26 have been added and are believed to be in allowable condition.

Claim 23 relates to a retainer for securing a heat sink to a circuit board component, the retainer comprising, a base portion, at least one arm coupled to the base portion, and a tab coupled to the at least one arm. The tab is configured to move between a first position and a second position relative to the base portion and is configured to position between two adjacent fins of the heat sink. Support for claim 23 is provided within the specification on page 12, line 25 through page 13, line 15, for example. No new matter has been added.

Claims 24-25 relate to a retainer for securing a heat sink to a circuit board component, the retainer comprising a base, at least one arm coupled to the base, and a tab coupled to the at least one arm, the tab configured to bend relative to the at least one arm. Support for the claims is provided within the specification on page 10, lines 17-25 and in Fig. 3, for example. No new matter has been added.

Claim 26, depending upon claim 24, relates to the arms of the retainer defining an alignment platform to orient the heat sink relative to the circuit board component. Support for the claims is provided within the specification on page 10, lines 1-16, for example. No new matter has been added.

#### Chen Reference

Chen relates to a high thermal performance and high reliability flip chip package assembly having a retainer frame 2 with a demountable heat spreader. The retainer frame 2 has a spreader side 5 and a package side 7.<sup>1</sup> The retainer clamp 2 includes a clamp 19 disposed on the retainer frame 2 to demountably clamp a package to the package side 7 of the retainer frame 2.<sup>2</sup> The retainer frame 2 also includes a spreader clamp 9 to couple a heat spreader 25 to the spreader side of the retainer frame 2.<sup>3</sup>

As described in Chen, the heat spreader 25 can include a secondary heat exchanger 61 disposed on the heat spreader 25 where the secondary heat exchanger acts to extend the surface area available for cooling.<sup>4</sup> In one arrangement, the “secondary heat exchanger 61 can include cooling fins 65 to further increase the surface area of the secondary heat exchanger 61 available for waste heat removal.”<sup>5</sup>

#### Rejections under §102(b)

Independent claims 1, 7, 13, 19, and 22 are rejected under 35 U.S.C. §102(b) as being anticipated by Chen

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<sup>1</sup> Chen, col. 4, l. 24-26.

<sup>2</sup> Chen, col. 4, l. 28-30.

<sup>3</sup> Chen, col. 5, l. 48-49.

<sup>4</sup> Chen, col. 7, l. 42-50.

<sup>5</sup> Chen, col. 7, l. 50-53.

"A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference."<sup>6</sup> "The identical invention must be shown in as complete detail as is contained in the ... claim."<sup>7</sup>

Independent claims 1, 7, 13, 19, and 22 relate to a retainer for securing a heat sink to a circuit board component. As amended in each the claims, the retainer comprises a base portion having a rail configured to engage a slot along a perimeter portion of the circuit board component. Such description is found in previously examined and allowable claims 4, 10, 16, and 21. The Office Action states that the "prior art of record is silent regarding a rail to be engaged with a slot along a perimeter portion of the component." As such, the prior art of record, including Chen, does not teach or suggest every element of the Applicant's independent claims 1, 7, 13, 19, and 22.

Because Chen does not teach or suggest every element of the Applicant's amended independent claims 1, 7, 13, 19, and 22, the claims are patentable over Chen and should be allowed to issue. Accordingly, the rejection of these claims should be withdrawn. Claims 2-6, which depend on claim 1, claims 8-12, which depend upon claim 7, claims 14-18, which depend upon claim 13, and claims 20 and 21, which depend upon claim 19 should also be allowed to issue as depending upon allowable independent claims (i.e., for at least the reasons presented). Reconsideration of the rejection is respectfully requested.

#### Rejections under §103(a)

Dependent claims 3, 6, 9, 12, 15, 18, and 20 are rejected under 35 U.S.C. §103(a) as being unpatentable over Chen.

In order to establish a *prima facie* case of obviousness, the Office Action must meet three criteria.

"First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference

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<sup>6</sup> *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987).

<sup>7</sup> *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989).

teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations.”<sup>8</sup>

As described above with respect to the Rejections under §102(b), Chen does not teach or suggest every element of the Applicant’s amended independent claims 1, 7, 13, 19, and 22, the claims are patentable over Chen. As such, Chen does not anticipate claims 3 and 6, which depend on claim 1, claims 9 and 12, which depend upon claim 7, claims 15 and 18, which depend upon claim 13, and claim 20, which depends upon claim 19. Claims 3, 6, 9, 12, 15, 18, and 20 should also be allowed to issue as depending upon allowable independent claims (i.e., for at least the reasons presented). Reconsideration of the rejection is respectfully requested.

Furthermore, the Applicants have added new claim 23 to the application. Claim 23 combines the subject matter of claim 1, as originally filed, with the subject matter of rejected claim 3. The Office Action has not established that Chen anticipates independent claim 23 (e.g., the combination of claim 1, as originally filed, with claim 3) because Chen does not disclose or suggest every element of the Applicants’ claim.

Claim 23 relates to a retainer for securing a heat sink to a circuit board component, the retainer comprising a base portion, at least one arm coupled to the base portion, and a tab coupled to the at least one arm. The **tab** is configured to move between a first position and a second position relative to the base portion and is **configured to position between two adjacent fins of the heat sink**. Such a configuration minimizes movement of the arms (i.e., associated with the tabs) relative to the circuit board component. In turn, the configuration of the tabs minimizes the potential for the retainer to become disengaged from heat sink and the circuit board component.

With respect to rejected claim 3, the Examiner states that “Chen discloses the claimed invention except having tabs to be positioned between adjacent fins”. As indicated above, Chen describes a retainer frame 2 having a spreader side 5 and a package side 7 where a package demountably clamps to the package side 7 of the retainer

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<sup>8</sup> *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

frame 2 and a heat spreader 25 couples to the spreader side of the retainer frame 2. Chen also describes the heat spreader 25 including a secondary heat exchanger 61, including cooling fins 65, disposed on the heat spreader 25. As shown in Fig. 5, Chen discloses the tabs 11 of the frame 2 as contacting the heat spreader such that the tabs 11 are not positioned between two adjacent fins of the heat sink. Chen does not teach or suggest positioning the tabs **between two adjacent fins of the heat sink**.

Furthermore, the Examiner states that it “would have been obvious at the time the invention was made to a person having ordinary skill in the art to dispose tabs between adjacent fins as disclosed in several prior art references cited in attached US PTO 892 form”. However, none of the several disclosed prior art references teach or suggest tabs of a retainer **configured to position between two adjacent fins of the heat sink**. If the rejection of claims 1 and 3 (i.e., new claim 23) is to be maintained, the Applicants respectfully request that it be pointed out with particularity where the cited prior art teaches such a retainer or suggests combining the frame of Chen with the disclosure of the prior art reference to form a retainer comprising a base portion, at least one arm coupled to the base portion, and a tab coupled to the at least one arm where the tab is configured to move between a first position and a second position relative to the base portion and is **configured to position between two adjacent fins of the heat sink**.

-14-

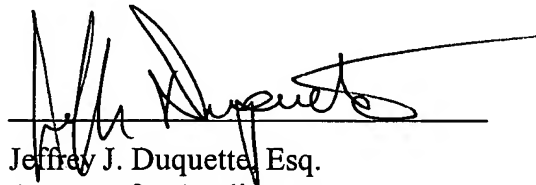
Conclusion

In view of the foregoing remarks, this Application should be in condition for allowance. A Notice to this affect is respectfully requested. If the Examiner believes, after this Response, that the Application is not in condition for allowance, the Examiner is respectfully requested to call the Applicants' Representative at the number below.

Applicants hereby petition for any extension of time which is required to maintain the pendency of this case. If there is a fee occasioned by this response, including an extension fee, that is not covered by an enclosed check, please charge any deficiency to Deposit Account No. 50-0901.

If the enclosed papers or fees are considered incomplete, the Patent Office is respectfully requested to contact the undersigned collect at (508) 366-9600, in Westborough, Massachusetts.

Respectfully submitted,



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